

The Chemical Nature of Matter

7-5 The student will demonstrate an understanding of the classifications and properties of matter and the changes that matter undergoes. (Physical Science)

7-5.4 Use the periodic table to identify the basic organization of elements and groups of elements (including metals, nonmetals, and families).

Taxonomy level: 3.2-B Apply Conceptual Knowledge

Previous/Future knowledge: Students have not been introduced to the periodic table in previous grade levels. Students will further develop the concept of the periodic table in high school Physical Science (PS-2.3).

It is essential for students to know how to use the periodic table to identify the basic organization of elements.

- A horizontal row on the periodic table is called a *period*.
- Every periodic table will have a square for each element with the atomic number, atomic mass, element name, and the element symbol.
- The elements on the periodic table are arranged numerically by atomic numbers.
- *Families*, also called groups, are vertical columns of elements on the periodic table; they are usually numbered 1-18. Elements in the same family have similar properties.

On the *periodic table* there is a zigzag line on the right side of the table. There are two sections of elements on the periodic table, metals and nonmetals.

Metals

- A major classification of elements generally located on the left side of the zigzag line on the periodic table.
- Examples of metals are: Sodium (Na), Calcium (Ca), Iron (Fe), and Aluminum (Al). The majority of elements are metals.

Nonmetals

- A major classification of elements generally located on the right side of the zigzag line on the periodic table.
- Examples of nonmetals are: Chlorine (Cl), Oxygen (O), Sulfur (S), and Iodine (I).

It is not essential for students to know how each element gets its atomic number (no subatomic particles are part of this standard). They do not need to know the names of the individual families of elements or to identify metalloids.

Assessment Guidelines:

The objective of this indicator is to *use* the periodic table to identify basic organization of elements on the periodic table, the metal and nonmetal divisions, and to locate families of elements; therefore, the primary focus of assessment should be to recognize the organization of the elements by using the periodic table. However, appropriate assessments should also require students to *exemplify* elements that are metals and nonmetals given a periodic table; *recognize* the location of an element on the periodic table; *recognize* the location of groups of metals and nonmetals; *recognize* that families are columns of elements; or *identify* an element using the organization of the periodic table (*atomic number or symbol*)._